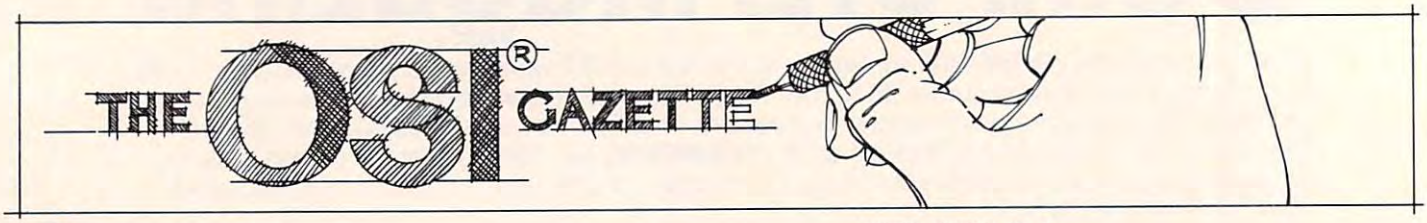

Super Cursor V1.3

Frank Cohen
Pacific Palisades, CA

My biggest complaint about Ohio Scientific's Superboard II has been about the awful video output. It's almost ironic noting all the good things the Superboard has going for it: a nice keyboard; a powerful Microsoft BASIC in ROM; a dependable cassette interface; 8K of RAM; and many other functions. The irony comes into play when you turn on the Superboard and take a look at the 24 by 24 video. And it gets worse as you start to use BASIC to list programs the effective display size becomes 23 by 20.

In reading through *The First Book of OSI*, from Elcomp Publishing, I found that a company names Silver Spur Electronics, in Chino, California, sells detailed instructions to double the display size by adding several jumpers and a couple of I.C.'s to the board. The modified display yields an effective display size of about 26 lines of 48 characters (which can be enlarged if you don't want a border around the display).

After making the modifications, though, the BASIC in ROM still thinks the memory map of the video display is the same, and so it only uses half the screen. Included with the modification instructions is a software patch which will allow BASIC to utilize the whole display. However, that, too, gives you only a *very* simple cursor. Using other computers I

```
                                ;SUPER CURSOR V1.3
                                ;Written by Frank Cohen
                                ;
                                ;Cursor Routine for OSI Superboard II
                                ;to suppliment Microsoft's Basic-in-ROM
                                ;cursor functions.
                                ;
                                ;Note: This program works with Steven
                                ;Chalfin's video modifications and needs
                                ;to be changed to work with a Superboard's
                                ;normal 24 by 24 video. At the end of this
                                ;listing are the changes for 24 by 24 video.
                                ;
                                ;
                                ;This program loads into 1E40-1FE7 hex
                                ;which is the top of memory on an 8K
                                ;Superboard II. It may be reassembled for other
                                ;addresses if desired.
                                ;
                                ;Directions: Once loaded the following must
                                ;be done to start Super Cursor-
                                ; 1. Set the Zero page locations
                                ; 2. Cold start BASIC limiting the memory size
                                ;    to 7624 (dec.).  MEM SIZ? 7624
                                ; 3. Poke the following-
                                ;       POKE 538,64:POKE539,30
                                ;At this point a solid white cursor should
                                ;appear at the home position (upper left corner)
                                ;If this happens you have successfully loaded
                                ;Super Cursor V1.3. If not, try it again.
                                ;
                                ;Options:
                                ; To turn off the scrolling function-
                                ;   POKE 7861,128:POKE 7862,30
                                ; To turn on the scrolling function-
                                ;   POKE 7861,105:POKE 7862,31
                                ; To change the cursor symbol-
                                ;   POKE 8033,X  (where x is a graphics number)
                                ;
                                ;HOME LOCATION = D0CC (hex)
                                ;Horizontal Boundary = 44    (2C hex)
                                ;Verticle Boundary = 26      (1A hex)
                                ;
                                ;BASIC Commands-
                                ; Clear Screen = PRINT CHR$(1)
                                ; Home Cursor = PRINT CHR$(2)
                                ;
                                ;Zero Page Usage
;>MR 1 80        >33 80 06
00E0 CC                 CURSLOC LOW;Cursor Location Low byte
00E1 D0                 CURSLOC HI ;Cursor Location High byte
00E2 20                 TEMP       ;Stores byte from cursor location
00E3 00                 HL         ;Horizontal Location of Cursor
00E4 00                 VL         ;Verticle Location of Cursor
00E5 00                 SCURS LOW  ;16 Bit scratch pad register
00E6 00                 SCURS HI   ;
                                ;
                                ;
1E40                            ;Start of Program
1E40 8D 02 02   Start   STA 0202        ; Save all register onto the
1E43 48                 PHA             ; the stack
1E44 8A                 TXA
1E45 48                 PHA
1E46 98                 TYA
1E47 48                 PHA
1E48 AD 02 02           LDA 0202
1E4B C9 5F      Menu    CMP $5F         ;Check key pressed for cursor
1E4D D0 03              BNE NDE         ;function
1E4F 20 BE 1F           JSR Left
1E52 C9 02      NDE     CMP $02
1E54 D0 03              BNE NHO
1E56 20 80 1E           JSR Home
1E59 C9 0D      NHO     CMP $0D
1E5B D0 03              BNE NCR
1E5D 20 95 1E           JSR CR
1E60 C9 0A      NCR     CMP $0A
1E62 D0 03              BNE NLF
1E64 20 AB 1E           JSR LF
1E67 C9 01      NLF     CMP $01
1E69 D0 03              BNE NCL
1E6B 20 C2 1E           JSR CLS
1E6E C9 00      NCL     CMP $00
1E70 F0 03              BEQ Exit
1E72 20 E8 1E           JSR Dispc
1E75 68         Exit    PLA             ;Restore all the resisters from
1E76 A8                 TAY             ;the stack
```

OSI TRS-80 COLOR-80 OSI

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OSI COLOR-80

found that I really liked being able to Home, or Clear Screen, or Line Feed, or Backspace the cursor. All these are not possible with the cursor program in the ROM.

Super Cursor solved my needs for an advanced cursor program. In addition to the above functions, it can actually Backspace the cursor (the BASIC in ROM version prints another underline), you can define what the cursor looks like by picking any of the graphics characters available, you can also scroll at the bottom of the display or wrap around to the top. All these functions are available in BASIC or you can use Super Cursor from a machine language program.

If you have not installed the video modifications for the larger display size you will need to modify several locations in Super Cursor. These modifications can be found in the listing after Super Cursor's machine language listing.

In operating Super Cursor, some steps must be taken to tell BASIC to use Super Cursor rather than its old cursor. First load Super Cursor into memory. If you have an assembler, you can reassemble it to fit anywhere in memory. It occupies approximately 425 bytes of memory. If you don't have an assembler, I would not advise trying to move Super Cursor as almost everything uses subroutines which need absolute addresses (you would have to renumber everything). Super Cursor, as it is listed, fits into the top portion of an 8K Superboard II.

Once loaded, it is necessary to set up the page zero memory vectors. There are seven bytes in all which must be set as follows:

00E0 CC D0 20 00 00 00 00

After you have completed this, you can cold-start BASIC. Be sure to limit BASIC's memory size to only 7624 bytes or else you will wipe out Super Cursor. To limit BASIC's memory, enter:

```
1E77 68              PLA
1E78 AA              TAX
1E79 68              PLA
1E7A 4C 6C FF        JMP FF6C        ;Jump back to BASIC
1E7D EA EA EA        NOP             ;For future expansion
                                     ;
1E80 20 53 1F  Home  JSR TC          ;Home routine
1E83 A9 D0           LDA $D0         ;Set Cursloc to DOCC
1E85 85 E1           STA Cursloc Hi
1E87 A9 CC           LDA $CC
1E89 85 E0           STA Cursloc Lo
1E8B A9 00           LDA $00         ;Set HL and VL to 00
1E8D 85 E4           STA VL
1E8F 85 E3           STA HL
1E91 20 60 1F        JSR SC
1E94 60              RTS
                                     ;
1E95 20 53 1F  CR    JSR TC          ;Carrage Return
1E98 A9 00           LDA $00         ;Subtract HL from Cursloc
1E9A 85 E6           STA SCURS HI
1E9C A5 E3           LDA HL
1E9E 85 E5           STA SCURS LO
1EA0 20 B0 1F        JSR SBCC
1EA3 A9 00           LDA $00
1EA5 85 E3           STA HL
1EA7 20 5A 1F        JSR CT
1EAA 60              RTS
                                     ;
1EAB A5 E4     LF    LDA VL          ;Line Feed
1EAD C9 19           CMP $19         ;Check for Scroll
1EAF D0 0A           BNE LFA
1EB1 20 53 1F        JSR TC          ;Carrage return and Scroll
1EB4 20 69 1F        JSR Scroll
1EB7 20 95 1E        JSR CR
1EBA 60              RTS
1EBB 20 95 1E  LFA   JSR CR          ;No scroll
1EBE 20 27 1F        JSR DOWN
1EC1 60              RTS
                                     ;
1EC2 A2 00     CLS   LDX $00         ;Clear Screen
1EC4 A9 20           LDA $20         ;Set up
1EC6 9D 00 D0  CLA   STA D000,X
1EC9 9D 00 D1        STA D100,X
1ECC 9D 00 D2        STA D200,X
1ECF 9D 00 D3        STA D300,X
1ED2 9D 00 D4        STA D400,X
1ED5 9D 00 D5        STA D500,X
1ED8 9D 00 D6        STA D600,X
1EDB 9D 00 D7        STA D700,X
1EDE CA              DEX
1EDF F0 03           BEQ CLSE
1EE1 4C C6 1E        JMP CLA
1EE4 20 5A 1F  CLSE  JSR CT
1EE7 60              RTS
                                     ;
1EE8 85 E2     DISPC STA Tempreg     ;Display a character
1EEA A5 E3           LDA HL
1EEC C9 2C           CMP $2C
1EEE F0 04           BEQ DISA        ;Check for a line overflow
1EF0 20 FB 1E        JSR Right
1EF3 60              RTS
1EF4 20 95 1E        JSR CR          ;Carrage return and line feed
1EF7 20 AB 1E        JSR LF
1EFA 60              RTS
                                     ;
1EFB 20 53 1F  RIGHT JSR TC          ;Cursor Right
1EFE A5 E3           LDA HL          ;Check for overflow
1F00 C9 2C           CMP $2C
1F02 F0 10           BEQ RA
1F04 E6 E3           INC HL          ;Increment Cursor
1F06 A9 00           LDA $00
1F08 85 E6           STA SCURS HI
1F0A A9 01           LDA $01
1F0C 85 E5           STA SCURS LO
1F0E 20 A2 1F        JSR ADDC
1F11 4C 23 1F        JMP FRI
1F14 A9 00     RA    LDA $00         ;Subtract 2C from Cursor
1F16 85 E3           STA HL
1F18 A9 00           LDA $00
1F1A 85 E6           STA SCURS HI
1F1C A9 2C           LDA $2C
1F1E 85 E5           STA SCURS LO
1F20 20 B0 1F        JSR SBCC
1F23 20 5A 1F  FRI   JSR CT
1F26 60
                                     ;
1F27 20 53 1F  DOWN  JSR TC          ;Cursor Down
1F2A A5 E4           LDA VL          ;Check for overflow
1F2C C9 1A           CMP $1A
1F2E F0 10           BEQ DDN
1F30 E6 E4           INC VL          ;Add 40 to Cursor
1F32 A9 00           LDA $00
1F34 85 E6           STA SCURS HI
1F36 A9 40           LDA $40
1F38 85 E5           STA SCURS LO
1F3A 20 A2 1F        JSR ADDC
```

7624, in response to the cold-start question: Mem Siz?

Now that you are running BASIC, all you have to do is to type POKE 538,64:POKE 539,30 and press ENTER. You should see the solid white cursor in the upper left (HOME) position of the display. If you hit the space bar, it should move. If it doesn't behave properly then go back into the Monitor Program and check to see if you entered Super Cursor correctly. It is quite easy to make a typing mistake with machine language programs.

If you don't want the cursor to scroll when it reaches the bottom of the screen, you can turn off the scroll function by typing: POKE 7861,128:POKE 7862,30. You can also turn on the scroll function by typing POKE 7861,105:POKE 7862,31. If you want to change the cursor symbol to some other graphics character, all you have to do is to type POKE 8033,x (where x is the graphics

```
1F3D 4C 4F 1F          JMP FDN
1F40 A9 00      DDN    LDA $00          ;Subtract 0640 from Cursor
1F42 85 E4             STA VL
1F44 A9 06             LDA $06
1F46 85 E6             STA SCURS HI
1F48 A9 40             LDA $40
1F4A 85 E5             STA SCURS LO
1F4C 20 B0 1F          JSR SBCC
1F4F 20 5A 1F   FDN    JSR CT
1F52 60                RTS
                                ;
1F53 A5 E2      TC     LDA TEMPREG      ;Temp reg. goes to Cursor location
1F55 A0 00             LDY $00
1F57 91 E0             STA (CURSLOC),Y
1F59 60                RTS
                                ;
1F5A A0 00      CT     LDY $00          ;Cursor location goes to Temp reg.
1F5C B1 E0             LDA (CURSLOC),Y
1F5E 85 E2             STA TEMPREG
                                ;
1F60 A9 A1      SC     LDA $A1          ;Cursor symbol goes to Cursor location
1F62 A0 00             LDY $00
1F64 91 E0             STA (CURSLOC),Y
1F66 A9 00             LDA $00
1F68 60                RTS
                                ;
1F69 20 53 1F   SCROLL JSR TC           ;Scroll display one
1F6C A9 20             LDA $20          ;Set up SCURS
1F6E 85 E2             STA TEMPREG
1E70 A9 00             LDA $00
1E72 85 E5             STA SCURS LO
1E74 A9 D0             LDA $D0
1E76 85 E6             STA SCURS HI
1F78 A2 00      SCRT   LDX $00          ;Scroll it
1F7A A0 40             LDY $40
1F7C B1 E5             LDA (SCURS),Y
1F7E 81 E5             STA (SCURS),X
1F80 A5 E5             LDA SCURS LO
1F82 18                CLC
1F83 69 01             ADC $01
1F85 85 E5             STA SCURS LO
1F87 90 02             BCC SCAT
1F89 E6 E6             INC SCURS HI
1F8B A5 E6      SCAT   LDA SCURS HI
1F8D C9 D8             CMP $D8
1F8F F0 03             BEQ SCON
```

number). Normally, the cursor is equal to 161, which is a white box. If you want to Home the cursor type, PRINT CHR$(2). If you want to Clear the screen type PRINT CHR$(1).

Until I began to use the Home and Clear functions, I didn't realize what could be accomplished in a BASIC program. The following is a short program which tests the Random Number Generator of the Superboard's Microsoft BASIC. By running this program, you will see the screen being updated as though the program POKEs the display with the correct information. Actually, the use of the HOME function is all that is being utilized.

```
10 REM RANDOM NUMBER
   GENERATOR TEST
        Remarks
20 DIM A(9)
30 PRINT CHR$(1),CHR$(2)
        Clear and Home
40 POKE 8033,32
        Change the cursor to a space
50 FOR I=1 TO 1000
60 X=INT(RND(1)*10)
70 A(X)=A(X)+1
80 PRINT CHR$(2)
        Home the cursor
90 FOR J=0 TO 9
100 PRINT J;"=";A(J)
110 NEXT J
120 PRINT"SAMPLE=";X
130 PRINT"I=";I
140 NEXT I
150 POKE 8033,161
        Restore cursor
160 END
```

As you can see by running this program, working with the Superboard II gets easier and easier with the help of an advanced cursor program like Super Cursor V1.3.


```
1F91 4C 78 1F          JMP SCRT
1F94 A2 40      SCON   LDY $40
1F96 A9 20      SCA    LDA $20          ;Blank bottom line
1F98 9D C0 D7          STA D7C0
1F9B CA                DEY
1F9C D0 F8             BNE SCA
1F9E 60                RTS
1F9F EA EA EA          NOP              ;for future expansion
                                        ;
1FA2 A5 E0      ADDC   LDA CURSLOC LO   ;Add SCURS to CURSLOC
1FA4 18                CLC
1FA5 65 E5             ADC SCURS LO
1FA7 85 E0             STA CURSLOC LO
1FA9 A5 E1             LDA CURSLOC HI
1FAB 65 E6             ADC SCURS HI
1FAD 85 E1             STA CURSLOC HI
1FAF 60                RTS
                                        ;
1FB0 A5 E0      SBCC   LDA CURSLOC LO   ;Subtract CURSLOC from SCURS
1FB2 38                SEC
1FB3 E5 E5             SBC SCURS LO
1FB5 85 E0             STA CURSLOC LO
1FB7 A5 E1             LDA CURSLOC HI
1FB9 E5 E6             SBC SCURS HI
1FBB 85 E1             STA CURSLOC HI
1FBD 60                RTS
                                        ;
1FBE 20 53 1F   LEFT   JSR TC           ;Cursor Left
1FC1 A5 E3             LDA HL           ;Check for overflow
1FC3 F0 10             BEQ LLE
1FC5 C6 E3             DEC HL           ;Add 01 to CURSLOC
1FC7 A9 00             LDA $00
1FC9 85 E6             STA SCURS HI
1FCB A9 01             LDA $01
1FCD 85 E5             STA SCURS LO
1FCF 20 B0 1F          JSR SBCC
1FD2 4C E4 1F          JMP LEFY
1FD5 A9 2C      LLE    LDA $2C          ;Add 2C to Cursor
1FD7 85 E3             STA HL
1FD9 A9 00             LDA $00
1FDB 85 E6             STA SCURS HI
1FDD A9 2C             LDA $2C
1FDF 85 E5             STA SCURS LO
1FE1 20 A2 1F          JSR ADDC
1FE4 20 5A 1F   LEFY   JSR CT
1FE7 60                RTS
                                        ;
                                        ;
                                        ;Routines
1E40            START                   ;Start of Program
1E80            HOME                    ;Home cursor
1EFB            RIGHT                   ;Cursor Right
1F27            DOWN                    ;Cursor Down
1E95            CR                      ;Carriage Return
1EAB            LF                      ;Line Feed
1EC2            CLS                     ;Clear Screen
1EE8            DISPC                   ;Display a character
1F53            TC                      ;Temp reg. goes to display
1F5A            CT                      ;Cursor char. goes to temp reg.
1F60            SC                      ;Cursor symbol goes to disply
1F69            SCROLL                  ;Scroll display one line up
1FA2            ADDC                    ;Add SCURS to CURSLOC
1FB0            SBCC                    ;Subtract SCURS from CURSLOC
1FBE            LEFT                    ;Cursor Left
                                        ;
                                        ;End
```

Modifications to Super Cursor V1.3 for 24 by 24 Video

Zero page locations must be changed as below:

00E0	85	Cursloc LO
00E1	D0	Cursloc HI

Make the following changes to the main program:

1E88	85	LDA $85
1EAE	17	CMP $19
1EED	17	CMP $17
1F01	17	CMP $17
1F1D	17	CMP $17
1F2D	17	CMP $17
1F45	0E	LDA $0E
1F49	02	LDA $20
1F7B	20	LDY $20
1F8E	D4	CMP $D4
1F95	20	LDY $20
1FD6	17	LDA $17
1FDE	17	LDA $17